

REMARKS

Claims 1-37 are all the pending claims.

I. Claim Objections

Claim 32 is objected to because of the following informalities: In the third line of claim 32, the phrase “consecutive of” should be replaced with “of consecutive”.

Applicant herein corrects the informality, and the objection to claim 32 should be withdrawn.

II. Claim Rejections - 35 U.S.C. § 102: Claims 1, 2, 6, 11, 22, 27, 31, 34, and 36 stand rejected under 35 U.S.C. 102(b) as allegedly being anticipated by Schantz U.S. Patent 5,124,720.

Of the rejected claims, claims 1, 11, and 22 are independent claims. In rejecting the claims, the Patent Office primarily focused on Schantz col. 3, lines 24-45, which is reproduced below:

“The fault-tolerant dot-matrix printing technique includes the steps of: testing the printhead for malfunctioning printing elements, choosing substitute printing elements to print in place of the malfunctioning printing elements, disconnecting the malfunctioning printing elements, rerouting print signals from the malfunctioning printing elements to the substitute printing elements, and altering the scan path (the course of the printhead down the page) to allow the substitute printing elements to print in place of the malfunctioning printing elements in addition to printing for themselves.

Fig. 1 shows one example of a fault-tolerant dot-matrix printer 20 made according to the present invention. The testing of the printing elements can be accomplished using a detector 28 which can be a piezoelectric membrane drop detector that sends out an electrical signal whenever a drop strikes it, and opto-electronic dot detector that measures the amount of light reflected from the paper, a person who examines a test pattern produced by the printer and types in the location of the malfunctioning printing element, or any other type of drop detector.” (Schantz col. 3, lines 24-45).

A. Claim 1

Schantz fails to teach or suggest at least recording the row on the **recording material**, detecting whether or not a print defect occurs on **the recorded row on the recording material**, and performing correction recording, **on the recording material**, relative to the row on which the print defect occurs, as recited in claim 1.

Schantz does not print on a sheet, detect whether a print defect occurs on that sheet, and (subsequently) correct the print defect on that **same** sheet. To the extent that Schantz teaches print error detection and rerouting of print data to different print elements, Applicant submits that the testing can be done relative to a test pattern, allowing correction before an actual print job. Applicant notes that the contemporaneous steps are not taught or suggested in Schantz, and the steps certainly are not performed on the **same** sheet. Thus, Applicant submits that the features of claim 1 are not anticipated by Schantz, and the § 102 rejection of independent claim 1, along with its dependent claims 2, 6, 27, and 36, should be withdrawn.

B. Claim 11

Schantz fails to teach or suggest at least recording rows on a recording material, detecting a broken recording element, and moving said recording head **again** to record the row using another normal recording element instead of a broken recording element, **where recording the row again occurs on the same recording material as the previous recording**, as recited in claim 11.

In Schantz, the fault-tolerant dot-matrix printing technique does not print on a sheet, detect a broken element, and then print again on the same recording material with a normal recording element in place of a broken element. That is because the fault-tolerant dot-matrix printing technique detects a broken recording element by using a test droplet on a separate sheet from normal printing. Schantz would not come back again to record on the same sheet where a test droplet was dropped because printing of a normal image is not done when Schantz is detecting a broken recording element, and thus Schantz would not teach or suggest the features disclosed in claim 11.

For the foregoing reasons, claim 11 is allowable over Schantz. Applicant respectfully requests that the § 102 rejection of claim 11 and its dependent claim 31 be withdrawn.

C. Claim 22

Schantz fails to teach or suggest at least discharging the recording material that has an image recorded from the printer, **setting the discharged recording material to the printer again**, detecting whether or not a print defect occurs on **the recorded row**, and **performing correction recording relative to the row with the print defect that is on the recording material**, as recited in claim 22.

In Schantz, the fault-tolerant dot-matrix printing technique accomplishes the testing of the printing elements by “using a detector 28 which can be a piezoelectric membrane drop detector that sends out an electrical signal whenever a drop strikes it, and opto-electronic dot detector that measures the amount of light reflected from the paper, a person who examines a test pattern produced by the printer and types in the location of the malfunctioning printing element, or any other type of drop detector”. (col. 3, line 38-45). However, Schantz does not **(first)** discharge a sheet with a printed image, **(second)** insert the same sheet with the image in the printer again, **(third)** test the printed image to detect a print defect, and **(last)** correct the print defect of the image that is on the printed sheet. Schantz would not come back again to record on the same sheet where a test droplet was dropped, because printing of a normal image is not performed when Schantz is detecting a broken recording element.

For the foregoing reasons, independent claim 22 is allowable over Schantz. Applicant respectfully requests the Patent Office to withdraw the § 102 rejection of independent claim 22 and its dependent claim 34.

III. Claim Rejections - 35 U.S.C. § 102: Claims 11, 13, 14, and 15 are rejected under 35 U.S.C. 102(e) as allegedly being anticipated by Tanaka et al. U.S. Patent 6,123,341.

Tanaka fails to teach or suggest at least recording the rows with the recording head on the recording material, detecting the broken recording element among said recording elements, and recording the row that would have been recorded with said broken recording element by moving said recording head again, where recording the row again is on the same recording material as the previous recording, as recited in claim 11.

In Tanaka, the block diagram of Fig. 10 teaches that a check pattern is printed out and scanned to determine if there is a defective printing element. (col. 12, lines 6-34). Fig. 12

describes the substitution mode, where a normal dot-forming element is used in place of a defective dot-forming element. (col. 13, lines 52-59). However, Tanaka does not teach or suggest (1) that the printed check pattern is used to detect the broken element and (2) that the printed check pattern is **printed on again** with a normal dot-forming element. The printed check pattern is not used again after a broken dot-forming element is determined. The detection with the printed check pattern and the substitution of elements in the substitution mode (not using the printed check pattern) are two separate and distinct events. Since the substitution mode does not print on the check pattern, Schantz cannot be said to record the row again on the same recording material as the previous recording, as recited in claim 11.

For the foregoing reasons, claim 11 is allowable over Schantz. Applicant respectfully requests that the § 102 rejection of independent claim 11 and its dependent claims 13-15 be withdrawn.

IV. Claim Rejections - 35 U.S.C. § 103: Claims 3, 12, 16-21, 23, 28, and 32 are rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Schantz U.S. Patent 5,124,720 as applied to claims 1, 11, and 22 above, and further in view of Ogata et al. U.S. Patent 5,722,007.

A. Claims 3, 12, 23, and 28

Schantz is deficient vis-à-vis base claims 1, 11, and 22, as discussed above. Ogata, applied for its use of a density detector, does not compensate for the deficiencies of Schantz. Even the combined teachings of Schantz and Ogata do not render unpatentable claims 1, 11, and 22, much less their dependent claims 3, 12, 23, and 28, respectively. Thus, claims 3, 12, 23, and 28 are allowable by virtue of their dependency, and the § 103 rejection should be withdrawn.

B. Claims 16-21 and 32

Of the rejected claims, claims 16 and 19 are independent claims. The following remarks apply to both independent claims 16 and 19.

Schantz fails to teach or suggest at least a failure judging means and a control means, where the failure judging means judges the defective row on the same recording material that the control means controls the recording element to record upon, as recited in claims 16 and 19.

Schantz discusses that the fault-tolerant dot-matrix printing technique detects a broken recording element by using a test droplet on a separate sheet from normal printing. (col. 3, lines 45). Also, in the fault-tolerant mode, Shcantz uses a substitution algorithm to choose a substitute printing element. (col. 3, lines 45-55). However, Schantz does not perform substitution printing on the same sheet where a test droplet was dropped. Thus, Schantz fails to teach or suggest the features of claims 16 and 19.

Ogata, applied for its use of a density detector, does not compensate for the deficiencies of Schantz. Even combined, the teachings of Schantz and Ogata do not render unpatentable the features of claims 16 and 19. Accordingly, the § 103 rejection of independent claims 16 and 19, along with their dependent claims 17, 18, 20, 21, and 32, should be withdrawn.

V. Claim Rejections - 35 U.S.C. § 103: Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schantz U.S. Patent 5,124,720 as applied to claim 1 above, and further in view of Aosaki et al. U.S. Patent 5,467,198.

Schantz is deficient vis-à-vis base claim 1. Aosaki, applied for its teaching regarding thermosensitive paper, does not compensate for the deficiencies of Schantz. Thus, dependent claim 4 is allowable by virtue of its dependency, and the § 103 rejection should be withdrawn.

VI. Claim Rejections - 35 U.S.C. § 103: Claim 5 is rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Schantz U.S. Patent 5,124,720 as applied to claim 1 above, and further in view of Saito U.S. Patent 4,561,789.

Schantz is deficient vis-à-vis base claim 1. Saito, applied for its teaching regarding thermally melted and thermally sublimated ink, does not compensate for the deficiencies of Schantz. Thus, dependent claim 5 is patentable by virtue of its dependency, and the § 103 rejection should be withdrawn.

VII. Claim Rejections - 35 U.S.C. § 103: Claims 7, 8, 10, 29, and 30 are rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Tanaka et al. U.S. Patent 6,123,341 and Noyes et al. U.S. Patent 6,775,022.

The following remarks are for independent claim 7 but apply by analogy to independent claim 8. Tanaka fails to teach or suggest at least an operation means for comparing said measured density with said predicted density every portion, said operation means obtaining

density difference of the defective portion having said measured density which is less than said predicted density, record correcting means for performing correction recording relative to said **defective portion**, and the record correcting means reciprocating said carriage **again** for the defective portion and driving said recording head in accordance with said density difference during the forward movement of the carriage, **where detection of the density difference and correction recording are performed on the same recording material**, as recited in claims 7 and 8.

As discussed above in section III., Tanaka uses the printed check pattern to detect a print defect. Tanaka also operates in the substitution mode to send data to normal dot-forming elements, instead of broken dot-forming elements, to print on a sheet. When printing in the substitution mode, however, the printed check pattern is not printed thereon. That is, detection and correction do not occur on the same sheet in Tanaka.

Furthermore, during the substitution mode, Tanaka does not correct any defective portion. That is, Tanaka does not endeavor to correct a print defect printed on a sheet, but endeavors only to substitute normal elements for broken elements. Thus, Tanaka fails to teach or suggest at least that detection of the density difference and correction recording relative to the defective portion having the density difference are performed on the same recording material, as recited in claims 7 and 8.

Noyes is applied for its teaching about measuring density, but Noyes does not compensate for the deficiencies of Tanaka. Even the combined teachings of Tanaka and Noyes do not render unpatentable the subject matter of claims 7 and 8.

For the foregoing reasons, independent claims 7 and 8, along with their dependent claims 10, 29, and 30, are allowable. Applicant respectfully requests that the § 103 rejection of claims 7, 8, 10, 29, and 30 be withdrawn.

VIII. Claim Rejections - 35 U.S.C. § 103: Claim 9 is rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Tanaka et al. U.S. Patent 6,123,341 and Noyes et al. U.S. Patent 6,775,022 as applied to claims 7 and 8 above, and further in view of Terajima et al. U.S. Patent 6,785,026.

Tanaka and Noyes are deficient vis-à-vis base claims 7 and 8. Terajima, applied for its teaching regarding a density detector with a light emitting element, does not compensate for the deficiencies of Tanaka and Noyes. Even combined, the teachings of Tanaka, Noyes, and Terajima fail to render unpatentable the subject matter of base claims 7 and 8. Thus, Applicant respectfully requests that the § 103 rejection of claim 9 be withdrawn.

IX. Claim Rejections - 35 U.S.C. § 103: Claims 24 and 25 are rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Schantz U.S. Patent 5,124,720, Komiya et al. U.S. Patent 6,287,027, and Ui et al. U.S. Patent 6,340,984.

Schantz fails to teach or suggest at least an operation means obtaining density difference of the defective portion having the measured density which is less than the predicted density, and record correcting means for performing correction recording relative to the defective portion, the record correcting means moving the carriage **again for the defective portion** and driving the recording head in accordance with the density difference during the movement of the carriage, **where, on the recording material, the operation means obtains the density difference of the defective portion and the record correcting means performs correction recording**, as recited in claim 24.

Schantz discusses that the fault-tolerant dot-matrix printing technique detects a broken recording element by using a test droplet on a separate sheet from normal printing. (col. 3, lines 45). Also, in the fault-tolerant mode, Schantz uses substitution algorithm to choose a substitute printing element. (col. 3, lines 45-55). However, Schantz does not perform substitution printing on the same sheet where a test droplet was dropped.

Komiya is applied for its teaching of a density nonuniformity test chart 81 and a density nonuniformity amount detection unit 38. (Office Action, page 21). In addition, Komiya uses a geometric correction chart with a predetermined pattern printed by the printer. A geometric correction coefficient is calculated, which can be sent to the density nonuniformity detection unit

for density correction. Finally, the corrected data is sent to the printer to be printed. Nevertheless, Komiya fails to teach or suggest that a density difference of the defective portion is obtained and correction recording is performed on the same sheet as either the geometric correction chart or the density nonuniformity test chart, because both chart are used only for test purposes.

Ui is applied for its teaching regarding inclination of a sheet. Ui does not teach or suggest the features of claim 24.

The combined teachings of Schantz, Komiya, and Ui fail to disclose at least that **on the recording material, the operation means obtains the density difference of the defective portion and the record correcting means performs correction recording**, as recited in claim 24.

For the foregoing reasons, claim 24 is allowable over the applied references, and Applicant respectfully requests that the § 103 rejection of independent claim 24 and its dependent claim 25 be withdrawn.

X. Claim Rejections - 35 U.S.C. § 103: Claims 25 and 26 are rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Schantz U.S. Patent 5,124,720, Komiya et al. U.S. Patent 6,287,027, and Ui et al. U.S. Patent 6,340,984 as applied to claim 24 above, and further in view of Noyes et al. U.S. Patent 6,297,888.

Schantz, Komiya, and Ui are deficient vis-à-vis base claim 24. Noyes does not compensate for the deficiencies of Schantz, Komiya, and Ui. Even the combined, teachings of the references do not render unpatentable claim 24. Thus, claims 25 and 26 are patentable at least by virtue of their dependency, and the § 103 rejection should be withdrawn.

XI. Claim Rejections - 35 U.S.C. § 103: Claim 33 is rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Schantz U.S. Patent 5,124,720 as applied to claim 20 above, and further in view of applicant's admitted prior art.

Schantz is deficient vis-à-vis base claim 19. Applicant's admitted prior art does not compensate for the deficiencies of Schantz. Accordingly, dependent claim 33 is patentable by virtue of its dependency from claim 19, and the § 103 rejection should be withdrawn.

XII. Claim Rejections - 35 U.S.C. § 103: Claim 37 is rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Tanaka et al. U.S. Patent 6,123,341 and Noyes et al. U.S. Patent 6,775,022 as applied to claim 7 above, and further in view of Schantz U.S. Patent 5,124,720.

Tanaka and Noyes are deficient vis-à-vis base claim 7. Schantz does not compensate for the deficiencies of Tanaka and Noyes. Thus, dependent claim 37 is patentable by virtue of its dependency, and the 35 U.S.C. § 103 rejection of dependent claim 37 should be withdrawn.

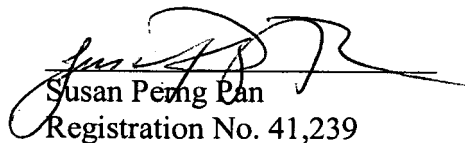
XIII. Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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